# Black Acara (*Cichlasoma bimaculatum*)
## Ecological Risk Screening Summary

**Web Version – 10/18/2012**

Photo: F. Naneix

## 1 Native Range and Nonindigenous Occurrences

### Native Range
From Nico et al. (2012):

"Tropical America. South America in the Guianas from Moruka River in Guyana east to about Sinnamary in French Guiana; also in Essequibo basin, and in adjacent Rio Branco drainage of Amazon basin (Kullander and Nijssen 1989)."

### Nonindigenous Occurrences
From Nico et al. (2012):

"The species has been established in Florida, since the early 1960s; it was first discovered in Dade County (Rivas 1965). More recently it was documented at Flint Penn Strand (Ceilley and Ceilley. 2000). The expanded geographic range of the species includes the counties of:"

- "Broward (Courtenay et al. 1974; Courtenay and Hensley 1979a);
- Collier (Courtenay and Hensley 1979a; Courtenay et al. 1986);
- Dade (Kushlan 1972; Courtenay et al. 1974; Hogg 1976; Courtenay and Hensley 1979a; Loftus and Kushlan 1987);
- Hendry (Courtenay and Hensley 1979a);
- Lee (Nico, unpublished data);
- Martin (museum specimens);
- Monroe (Kushlan 1972; Courtenay et al. 1974; Courtenay and Hensley 1979a; Loftus and Kushlan 1987), and
- Palm Beach (Courtenay et al. 1974; Courtenay and Hensley 1979a)."

"There are unconfirmed reports or possible occurrences of this species in Glades and Okeechobee counties (Courtenay et al. 1986; Courtenay and Stauffer 1990). It is established in Big Cypress National Preserve and in Everglades National Park (Kushlan 1972; Loftus and Kushlan 1987; Lorenz et al. 1997; Tilmant 1999; Lovtus 2004). It is also established in Florida Panther National Wildlife Refuge (USFWS 2005)."

## Means of Introductions

From Nico et al. (2012):

"In southeastern Florida, introduction was the result of escapes and intentional releases from fish farms, probably during the mid- to late 1950s (Courtenay and Hensley 1979a). Some releases were deliberate attempts to dispose of unwanted and sometimes illegal fish stocks (Courtenay and Stauffer 1990)."

## Remarks

From Nico et al. (2012): "Established in Florida."

"The first Florida specimens of *C. bimaculatum* were reported and identified as *Aequidens portalegrensis* (= *Cichlasoma portalegrense*) by Rivas (1965), Bailey et al. (1970), Kushlan (1972), and others. Cultured in Florida possibly since the 1930s, *Cichlasoma bimaculatum* remained an important part of the aquarium trade until the late 1950s, and probably was the first aquarium fish to become established in open waters of Florida (Courtenay and Stauffer 1990). One of the most abundant introduced species in south Florida canal systems during the early 1970s, *C. bimaculatum* has been gradually replaced by *Tilapia mariae* as the most abundant cichlid, possibly through competition for space (Courtenay and Hensley 1979a, 1979b; Loftus and Kushlan 1987). Loftus and Kushlan (1987) provided a map showing the species' distribution in south Florida. Throughout its south Florida range, it is much more common in disturbed habitats, mainly canals, than in natural habitats (Loftus and Kushlan 1987). Spawning has been observed during every month of the year in southeastern Florida (Courtenay 1989)."

# 2 Biology and Ecology

## Taxonomic Heirarchy

From ITIS (2012):

Kingdom Animalia
Phylum Chordata
Subphylum Vertebrata
Superclass Osteichthyes
Class Actinopterygii
Subclass Neopterygii
Infraclass Teleostei
Superorder Acanthopterygii
Order Perciformes
Suborder Labroidei
Family Cichlidae
Genus Cichlasoma
Species Cichlasoma bimaculatum

Taxonomic standing: valid

## Size, Weight, Age

From Froese and Pauly (2010):

"Max length : 12.3 cm SL male/unsexed; (Kullander 2003); 30 cm TL (female); common length : 12.0 cm TL male/unsexed; (Hugg 1996)"

## Environment

From Froese and Pauly (2010):

Benthopelagic; Freshwater (catadromous); pH range: 6.5 – 7.0

## Climate/Range

From Froese and Pauly (2010): Tropical; 16°C - 24°C (Riehl and Baensch 1996); 12°N - 1°N

## Distribution

From Froese and Pauly (2010):

"South America: Orinoco River basin, in the Caroni in River Venezuela; Guianas, from the Essequibo River to the Sinnamary River; Amazon River basin, in the upper Branco River basin."

## Biology

From Froese and Pauly (2010):

"Occurs in canals and swamps (Mills and Vevers 1989). Tolerates low oxygen. Feeds on crustaceans and insects (Mills and Vevers 1989). Males are bigger than females which become mature at 7 to 9 cm (20-25 g). Spawning occurs at the start of the rainy season. About 700 eggs are spawned on open substrate and are cared for by the parents. Max length 35 cm TL (Ref. 35237)."

## Human uses

From Froese and Pauly (2010):

"Fisheries: of no interest; gamefish: yes; aquarium: commercial"

## Diseases

From Froese and Pauly (2010):

"Mycobacterium chelonae abscessus"
"Mycobacterium fortuitum"
"Mycobacterium simiae"

*C. bimaculatum* is known to harbor and transmit bacterial pathogens that can cause a fatal disease (tuberculosis) among a wide variety of fish, as well as irritating skin lesions and pulmonary complications in humans (Gray et al. 1990, Howard et al. 1987, Landsell et al. 1993, Nigrelli et al. 1963, and Parisot et al. 1970).

## Threat to humans

From Froese and Pauly (2010): "Disease vector"

# 3 Impacts of Introductions

Considered a competitor with native sunfish for spawning areas; juvenile bands of *C. bimaculatum* have been observed to surround spawning bluegill *Lepomis macrochirus* aggressively in attempts to feed on eggs (Hogg 1976).

# 4 Global Distribution

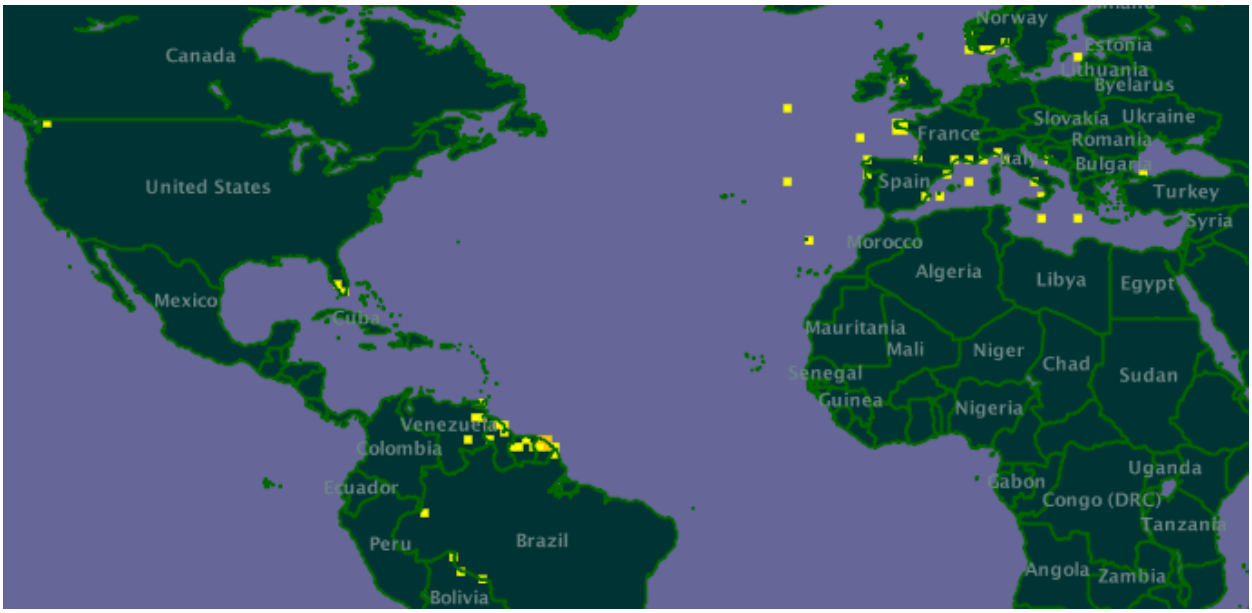


**Figure 1 (above).** Global distribution of *C. bimaculatum*. Map from GBIF (2010). The location in Oregon (United States) was not used as it does not represent an established population.

# 5 Distribution within the United States


**Figure 2 (above).** Distribution of *C. bimaculatum* in the United States. Map from Nico et al. (2012).

# 6 CLIMATCH

## Summary of Climate Matching Analysis

The climate match (Australian Bureau of Rural Science 2010; 16 climate variables; Euclidean Distance) was high in Florida, some of the Great Lakes States, and along the West Coast. Medium matches covered the rest of the country except for the Northern Plains States. Climate 6 match indicated that the US has a high climate match. The range for a high climate match is 0.103 and greater; the climate match of *C. bimaculatum* is 0.223.

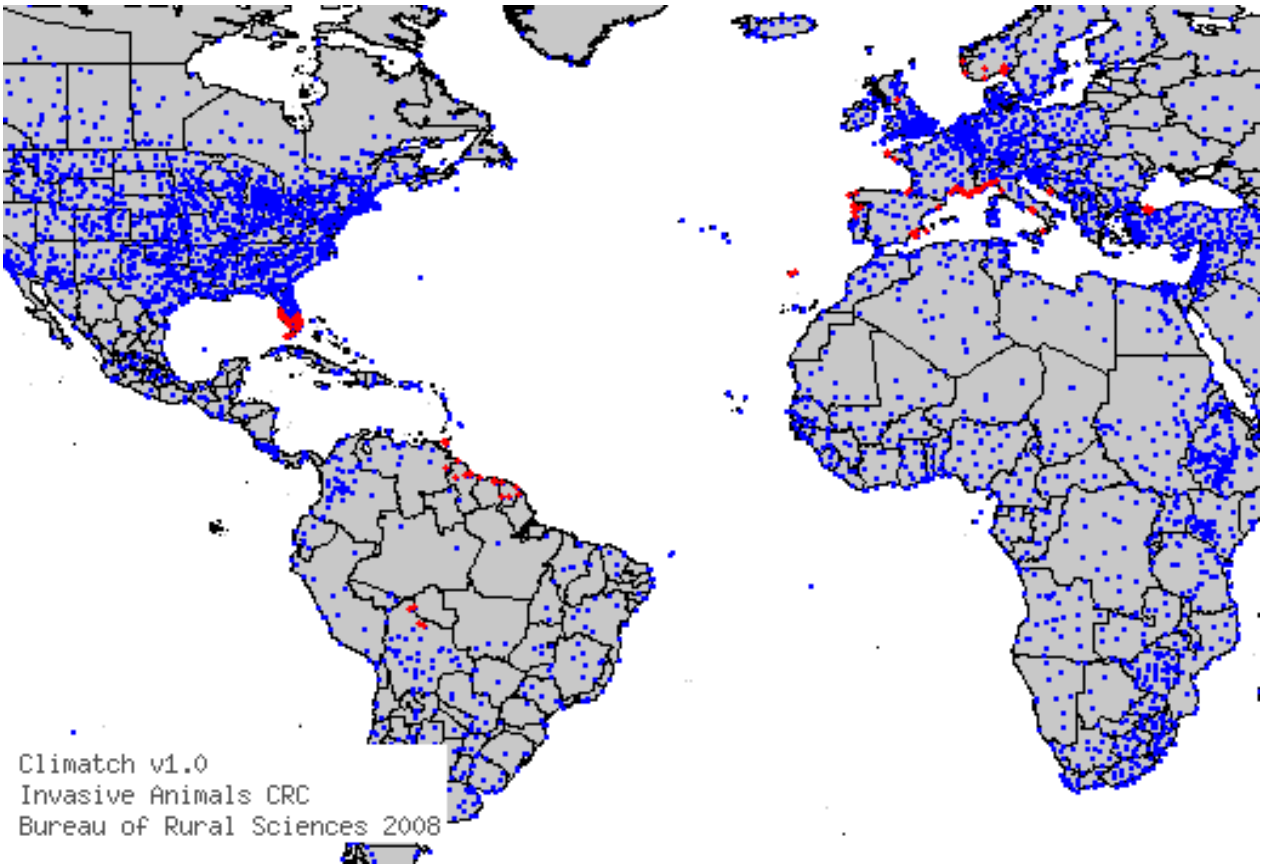


**Figure 3 (above).** CLIMATCH (Australian Bureau of Rural Science 2010) source map showing weather stations selected as source locations (red) and non-source locations (blue) for *C. bimaculatum* climate matching. Source locations from GBIF (2010) and Nico et al. (2012).

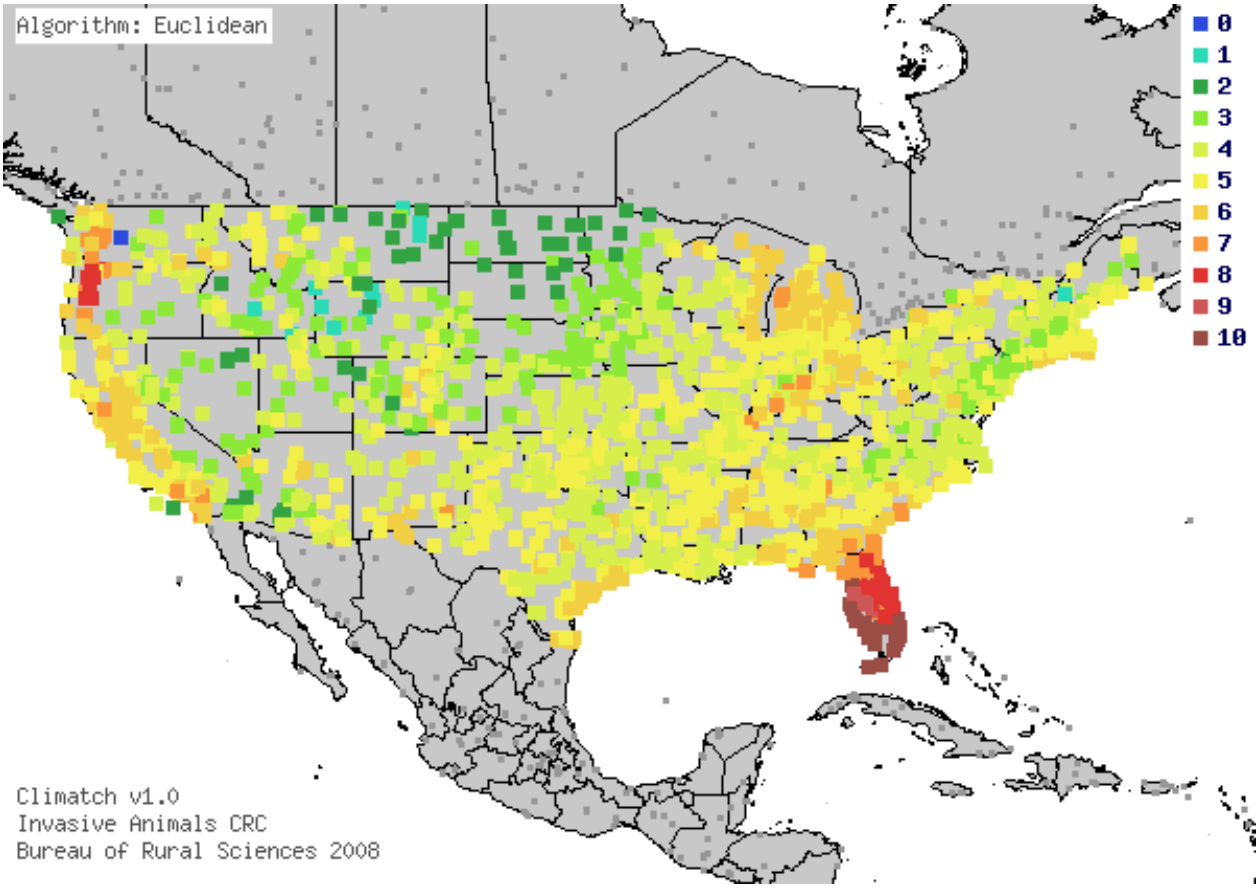


**Figure 4 (above).** Map of CLIMATCH (Australian Bureau of Rural Science 2010) climate matches for *C. bimaculatum* in the continental United States based on source locations reported by GBIF (2010) and Nico et al. (2012).. 0= Lowest match, 10=Highest match.

**Table 1 (below).** CLIMATCH (Australian Bureau of Rural Science 2010) climate match scores.

| CLIMATCH Score | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Count | 1 | 12 | 65 | 221 | 629 | 605 | 295 | 63 | 40 | 5 | 38 |
| | | | | | | | | | | | |
| Climate 6 Proportion = | | | 0.223 | (High) | | | | | | | |

# 7 Certainty of Assessment

Information on the biology of *C. bimaculatum* is fairly abundant. However, there is very little information available on the impacts caused by introduction of this species. In order for higher certainty more research is needed. Certainty of this assessment is medium.

# 8 Risk Assessment

## Summary of Risk to the Continental United States

*C. bimaculatum* is established in Florida, spawns throughout the year, and competes for spawning habitat with native species of fish in south Florida drainage canals at trust resource sites including national parks, national preserves, and national wildlife refuges. *C. bimaculatum* is known to harbor and transmit bacterial pathogens that can cause a fatal disease (tuberculosis) among a wide variety of fish, as well as irritating skin lesions and pulmonary complications in humans (Gray et al. 1990, Howard et al. 1987, Landsell et al. 1993, Nigrelli et al. 1963, and Parisot et al. 1970). The overall risk of this species is considered high due its disease carrying aspects (See Sec. 2 and 8).

## Assessment Elements

- **History of Invasiveness (Sec. 3):** High
- **Climate Match (Sec. 6):** High
- **Certainty of Assessment (Sec. 7):** Medium
- **Remarks:** Potential disease vector to native fish and humans.
- **Overall Risk Assessment Category:** High

# 9 References

**Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 10.**

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# 10 References Quoted But Not Accessed

**Note: The following references are cited within quoted text within this ERSS, but were not accessed for its preparation. They are included here to provide the reader with more information.**

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